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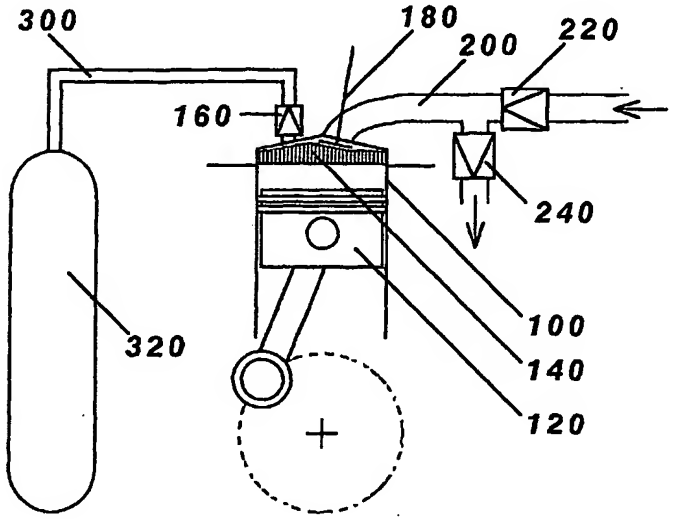
(54) Title: ISOTHERMAL RECIPROCATING MACHINES



(57) Abstract: A reciprocating gas compressor is described operating according to an extended cycle of 4, 6 or more strokes, wherein the first two strokes are sequential induction and compression strokes using a low pressure gas as working fluid and compressing it to a high pressure gas, and the remaining strokes are pairs of sequential filling and emptying strokes using more of the low pressure gas as heat transfer fluid for transferring heat from inside the gas compressor to outside the gas compressor. The gas compressor also contains an in-cylinder heat regenerator for absorbing heat from the compressed gas and releasing heat to the heat transfer fluid thus achieving near-isothermal compression. Using parallel principles, a reciprocating gas expander is also described for achieving near-isothermal expansion. Also described are reciprocating machines using the near-isothermal gas compressor and near-isothermal gas expander in combination according to the Ericsson heat engine cycle, the Stirling heat engine cycle and the Stirling refrigeration cycle.

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